

# Montana

## General Engineering Planning and Design Guide

### for Engineering Drawings

<u>Drafting</u>	<u>References</u>	✓
Drafting should be performed with efficiency and in a manner that will result in clarity and understanding of the information presented, yet should be brief.	MT Drafting Guide NEM 541	
<ul style="list-style-type: none"> <li>Drawings should be complete and logically laid out in accordance with principles in the Montana Drafting Guide.</li> </ul>		<input type="checkbox"/> x
<ul style="list-style-type: none"> <li>Use standard drawings when possible.</li> </ul>	MT Standard Drawing Hbk.	<input type="checkbox"/>
<ul style="list-style-type: none"> <li>May use photocopy machine and previously drawn parts to assemble new drawing (cut and paste copy).</li> </ul>		<input type="checkbox"/>
<ul style="list-style-type: none"> <li>All lines and letters should be clear, sharp and make readable copies.</li> </ul>		<input type="checkbox"/> x
<ul style="list-style-type: none"> <li>All drawings for a job should be the same size. Use standard sheets when possible.</li> </ul>		<input type="checkbox"/>
<ul style="list-style-type: none"> <li>Notes on drawings should be limited to those required for complete and accurate interpretation of the drawings. Leave off calculations and notes not needed for construction.</li> </ul>		<input type="checkbox"/>
<u>Minimum Contents--All Drawings</u>	NEM 541.30	
1. Descriptive information (title block).		
<ul style="list-style-type: none"> <li>Job class above title block and approval signature in title block (first page only).</li> </ul>		<input type="checkbox"/> x
<ul style="list-style-type: none"> <li>Individual, group or project name.</li> </ul>		<input type="checkbox"/> x
<ul style="list-style-type: none"> <li>Title of drawing (plan, sections, detail, etc).</li> </ul>		<input type="checkbox"/> x
<ul style="list-style-type: none"> <li>County, State.</li> </ul>		<input type="checkbox"/> x
<ul style="list-style-type: none"> <li>Name of organization making the drawing (NRCS).</li> </ul>		<input type="checkbox"/> x
<ul style="list-style-type: none"> <li>Designers initials and date.</li> </ul>		<input type="checkbox"/> x
<ul style="list-style-type: none"> <li>Initials of draftsperson and date.</li> </ul>		<input type="checkbox"/> x
<ul style="list-style-type: none"> <li>Initials of person checking drawing.</li> </ul>		<input type="checkbox"/> x
2. Location map or precise description of job location.		<input type="checkbox"/> x

## General - Engineering Drawings

	<u>References</u>	✓
3. Plan view drawing showing layout of all parts of the job. An aerial photo map with improvements drawn on it can sometimes be used if a title block is added. Views at more than one scale may be needed.		
▪ Access to site and important physical features (roads, buildings, fences, canals, etc).	<input type="checkbox"/>	
▪ North arrow.	<input type="checkbox"/>	x
▪ Drawing scale (Bar scale).	<input type="checkbox"/>	x
▪ Benchmarks and survey control.	<input type="checkbox"/>	x
▪ Show all known utilities that may be affected by or which could be a hazard during construction.	<input type="checkbox"/>	x
4. Profile for pipes, ditches, dikes.		
▪ Show stations at bottom, increasing left to right.	<input type="checkbox"/>	x
▪ Show elevations at left.	<input type="checkbox"/>	x
▪ Show and label natural groundline and improvements.	<input type="checkbox"/>	x
▪ Show and label hydraulic gradeline if applicable.	<input type="checkbox"/>	
▪ Show stations, elevations and descriptive note where profile changes or structures occur.	<input type="checkbox"/>	x
5. Typical cross sections for ditches and embankments.		
▪ View in direction of increasing stations and note on drawings.	<input type="checkbox"/>	
▪ Show dimensions and elevations.	<input type="checkbox"/>	
▪ Put applicable station and/or range under each section.	<input type="checkbox"/>	
▪ Show center line or offset line on each section.	<input type="checkbox"/>	
▪ Note stating direction of view (looking upstream or downstream).	<input type="checkbox"/>	
6. Structure Details (with dimensions).		
▪ Plan view.	<input type="checkbox"/>	
▪ Elevation view.	<input type="checkbox"/>	
▪ End view.	<input type="checkbox"/>	
▪ Section views.	<input type="checkbox"/>	
▪ Detail views.	<input type="checkbox"/>	
▪ Three dimensional view (if complexity requires additional clarification). Sometimes a single three-dimensional view with dimensions can replace plan, elevation and end view.	<input type="checkbox"/>	

## General - Engineering Drawings

	<u>References</u>	
7. Notes and tables		✓
Drawing notes or tables showing elevations, dimensions, pressure ratings, sizes of all valves, descriptions of special fittings, gates and appurtenances.		<input type="checkbox"/>
8. Check drawing notes versus construction specifications for compatibility.		<input type="checkbox"/>

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✖ This activity or documentation is usually required on each job.